PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
4024-4010PC		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US02/22092	28 June 2002 (28.06.2002)	29 June 2001 (29.06.2001)
International Patent Classification (IPC) or national classification and IPC		
IPC: **G02B 6/36**(2006.01) USPC: 385/53,59,65,66,71,137		
Applicant		
XANOPTIX, INC.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of _____ sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of report with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
29 January 2003 (29.01.2003)	20 September 2006 (20.09.2006)
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/ US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450	Authorized officer Rhonda Lee Bell Tulsidas C Patel
Facsimile No. (571) 273-3201	Telephone No. (571) 272-1850

I. Basis of the report

1. With regard to the **elements** of the international application:*

☒ the international application as originally filed.

☒ the description:

pages 1-25 as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

☒ the claims:

pages 26-30, as originally filed
pages NONE, as amended (together with any statement) under Article 19
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

☒ the drawings:

pages 1-20, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

☐ the sequence listing part of the description:

pages NONE, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination(under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages NONE

☐ the claims, Nos. NONE

☐ the drawings, sheets/~~fig~~ NONE

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*
*** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims 1-9, 11, 13-22, 25, 26	YES
	Claims 10, 12, 23, 24, 27	NO
Inventive Step (IS)	Claims 1-9, 17-22	YES
	Claims 10-16, 23-27	NO
Industrial Applicability (IA)	Claims 1-27	YES
	Claims NONE	NO

2. CITATIONS AND EXPLANATIONS
Please See Continuation Sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Please See Continuation Sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the questions whether the claims are fully supported by the description, are made:

Claims 17-19 are objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because claims 17-19 indefinite for the following reason(s):

Claim 17 recites a low precision piece being coupled to the two high precision slices and a chamber separating the two high precision slices. However, claim 17 does not recite the structural relationship between the low precision piece and the chamber. According to the present specification the chamber is the low precision piece, because a volume of the peripheral shape of the low precision piece forms the chamber. Furthermore, the present specification does not explain the instant invention to use separate low precision piece and chamber. Since claim 17 recites both low precision piece and chamber without reciting their relationship, it is not clear whether the low precision piece and the chamber are one element or two separate elements.

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Claims 10 and 12 lack novelty under PCT Article 33(2) as being anticipated by Boudreau et al (US 6,731,853 B2).

Boudreau discloses an apparatus to constrain optical fibers comprising two silicon wafers 310 and 320, a separator 330 and optical fibers 350. Two silicon wafers; each having a thickness, a first side, a second side opposite the first side and an array of fiber holes 340. The separator 330 is connecting the two silicon wafers 310 and 320 and separating the two silicon wafers 310 and 320 from each other by spacing greater than the thickness. The optical fibers are connecting fiber holes in one of the two silicon wafers to fiber holes in the other of the two silicon wafers. The second silicon wafer 320 is orientated perpendicular to the first silicon wafer 310 so that the fiber holes of the first silicon wafer 310 are offset from the fiber holes of the second silicon wafer 320.

Claims 23, 24 and 27 lack novelty under PCT Article 33(2) as being anticipated by Sakai et al (US 5,815,621).

Sakai discloses an optical connector comprising a first plate 110 having holes 121 and 122, a second plate 610 having holes and a chamber 140. The first plate 110 and the second plate 610 are connected by the chamber 140 to form a ferrule component 100, which is inserted in a ferrule location of the optical connector. The chamber 140 separates the first plate 110 from the second plate 610. Optical fibers 720 are inserted in one of the holes in the first plate 110. An epoxy 790 is placed in the chamber 140. The first plate 110 and the second plate 610 is inserted onto an alignment pin 130.

Claims 11 and 13-16 lack an inventive step under PCT Article 33(3) as being obvious over Boudreau et al in view of the Background of the invention of the present specification.

While Boudreau does not explain different types of the optical fiber and the commercial fiber optic connector as recited in claims 11 and 13-16, the Background of the invention of the present specification states that the different types of optical fiber and the commercial fiber optic connector recited in claims 11 and 13-16 already exist and are known in the art of an optical fiber

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the apparatus taught by Boudreau such that it would have an optical fiber and fiber optic connector as taught by instant invention because it only deals with the use of one known optical fiber and connector over the other known optical fibers and connectors.

Claims 25 and 26 lack an inventive step under PCT Article 33(3) as being obvious over Sakai et al in view of Boudreau et al.

While Sakai does not state the holes of the plates being formed by etching or having an oval cross-section, Boudreau teaches that the holes of the wafers 310 and 320 are formed by etching. Boudreau also teaches that the shape of the holes is not limited to one

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

shape, but can have different shapes.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the optical connector taught by Sakai such that it would have oval shape holes formed by etching as taught by Boudreau because etching process for forming holes is the easiest way to form holes and the shape of the holes only deals with a designer's choice since the shape of the holes does not change the function of the apparatus.

Claims 1-9 and 17-22 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a commercial fiber optic connector comprising two high precision slices, first and second, having fiber holes, a third high precision slice having fiber holes and a separator or a low precision piece coupling the two high precision slices and the third high precision slice. The separator separates the two high precision slices from the third high precision slice. Also, the holes of the first high precision slice are offset from the holes of the second high precision slice.

Claims 1-27 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

US 5,815,621 (SAKAI et al) 29 September 1998, see columns 4 and 5.

US 6,731,853 B2 (BOUDREAU et al) 04 May 2004, see columns 4-6.

Continuation of Section VII. Certain defects:
The drawings are objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or content thereof:

First and second high precision slices abutting to form a first unit and a separator separating the first unit from a third high precision slice are not shown.

Optical fibers, each having a first part and a second part and separated by lengths wherein the optical fibers having their first parts within fiber holes in one of two high precision slices and their second parts within fiber holes in the other of the two high precision slices are not shown.

Reference character "106" has been used to designate both connector and alignment piece.

Reference character "1002" has been used to designate both chamfered corner and microlenses.

Figure 8, the reference number 802 pointing at the large hole seems that the reference number should he 806

The reference number 112 recited on page 19, line 11 is missing in Figure 1.
The reference numbers 804 and 806 recited on page 19, lines 5 and 6 are missing in Figure 8.
The reference number1102 recited on page 24, line 1 is missing in Figure 11.
The reference symbol recited on page 29, line 4 is missing in Figure 21.
Fiber 1 recited on page 32, line 1 is not in the drawings.
Ferrule 2614 recited on page 35, line 1 is not in the drawings.
The reference number 2616 recited on page 35, line 3 is missing in Figure 26.
A high precision piece 2700 recited on page 35, line 12 is missing in Figure 27.

The reference number 1510 in Figure 15 is not in the present specification.

The description is objected to as containing the following defect(s) under PCT Rule 66.2(a)(iii) in the form or contents thereof:

On page 2, line 7, the examiner suggests the applicant to change "optical fiber 104" to -- fiber 104 -- in order to have consistent terminology for the same element.

Page 3, line 6 recites, "connector hole 200," but line 9 recites, "the ferrule hole 200." If these two elements are the same element, they should have the same name.

~~On page 3, line 14, "hole centers 204" should be -- hole centers 206 -- and "adjacent fibers 200" should be -- adjacent fibers 202 --.~~

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

On page 3, line 16, "the fibers 200" should be -- the fibers 202 --.

On page 22, line 7, "holes 802" should be -- holes 806 --.

On page 31, line 17, the examiner suggests the applicant to change "thirteen pieces" to -- twelve pieces -- since Figure 23 only shows twelve pieces stack.

On page 35, line 10, the examiner suggests the applicant to change "the array 2618" to -- the array of transmiters 2618 --.

Claims 1, 14, 17 and 20 are objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or contents thereof:

The present specification does not explain a third high precision slice being separated from first and second high precision slices by a chamber; at least one of the optical fibers being a fused optical fiber; and optical fibers, each having a first part and a second part and separated by lengths wherein the optical fibers having their first parts within fiber holes in one of two high precision slices and their second parts within fiber holes in the other of the two high precision slices.

It seems that "the first high precision slices" recited in claim 1, line 11 should be -- the first high precision slice --.

Claim 17, line 6 recites, "high precision slices," but line 9 recites, "high precision pieces." The terminology for the same element should be same consistently.

Claim 17 recites the limitation "the connector housing" in line 14. There is insufficient antecedent basis for this limitation in the claim.